DRAFT 3/27/03

SOLICITATION OF RECOMMENDATIONS FOR GRAND CHALLENGES IN GLOBAL HEALTH

Introduction

The Bill and Melinda Gates Foundation, in collaboration with the National Institutes of Health, is initiating a program to support scientific work that addresses Grand Challenges in Global Health. In this memorandum, we summarize the key points that define Grand Challenges and describe how recommendations for Grand Challenges should be made and will be evaluated.

The Grand Challenges in Global Health Initiative (GCGHI) seeks the participation of the global scientific community in articulating the "Grand Challenges" for scientific exploration that will ultimately increase research attention to the most critical health problems in the developing world. Although there are enormous challenges that relate to poverty, access to health interventions and delivery systems in developing countries, this initiative is focused on the grand scientific and technological challenges in health that are not being addressed currently

What is a Grand Challenge?

A Grand Challenge is a call for a specific scientific or technological innovation that would remove a critical barrier to solving an important health problem in the developing world with a high likelihood of global impact and feasibility.

A Grand Challenge is neither the statement of the global health problem itself (e.g., malaria or AIDS) nor the request for a specific health intervention (e.g., a drug or vaccine), but the call for a discrete scientific or technological innovation which will break through the roadblock that stands between where we are now and where we would like to be in science, medicine, and public health.

For example, a Grand Challenge could be the discovery or creation of:

- A novel way to neutralize HIV that may be the critical limiting step in developing a preventive vaccine
- An innovative technology that provided a fundamentally distinct platform to achieve point-of-care, accurate and affordable diagnostics
- A viable method to alter mosquito behavior, control mosquito populations or make mosquitos inhospitable to disease organisms
- A definitive way to stabilize antigens to heat to avoid the "cold chain" for vaccines

What is the scope of the Grand Challenges in Global Health Initiative?

The GCGHI will address the diseases and health conditions that cause the greatest morbidity and mortality in the developing world, thus accounting for the enormous health disparities between the developing and the developed world, and that receive disproportionately less attention from the scientific and technical community than their consequences demand. Any scientific approach that has the potential to address a Grand Challenge in a novel and potentially powerful way might be supported by the initiative.

What are the purposes of the Grand Challenges in Global Health Initiative?

The primary intention of the initiative is to stimulate research that will produce solutions to the identified Grand Challenges. The initiative is expected to draw widespread attention to interesting problems with major consequences for public health; in addition, it will provide funds generously for attempts to solve those problems. These features of the initiative should serve as a stimulus to increase participation in science relevant to disease in the developing world by scientists everywhere and to encourage collaborations among them.

How will recommendations for Grand Challenges be solicited?

Widespread advertisements, news articles, letters to scientific societies and institutions, electronic mailings and postings on Websites, and other modern means for spreading information will be used to insure that all relevant parties are aware that the GCGHI is seeking recommendations for Grand Challenges before the deadline of _____. The initiative leaders hope to receive recommendations from all sectors of the scientific and medical world, including both developed and developing countries.

How will the recommendations for Grand Challenges be evaluated?

All recommendations will be reviewed and judged by the staff and Scientific Board of the GCGHI. Descriptions of a recommended Grand Challenge should include a statement summarizing the proposed grand challenge, as well as comments addressing the points below, which are also the criteria that will be used to select the grand challenges:

- The magnitude of the health problem being addressed and its alignment with the scope of the program.
- The identification of the scientific or technical roadblock to achieving a solution and why this roadblock is limiting on a critical path to achieving the solution.
- The soundness of the scientific and technical foundation for the proposed grand challenge, not merely the ease or likelihood of success. (Risky but well-founded ideas will be valued.)
- The impact of solving the grand challenge on the health problem.
- The feasibility of widely implementing the solution to the grand challenge in the context of the developing world.

After approval of the full list by the Scientific Board, the selected Grand Challenges will be widely published and advertised to solicit research grant proposals from the entire research community.

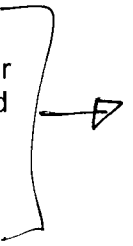
Example of the format to use in proposing a Grand Challenge for Global Health

Statement summarizing proposed grand challenge: We challenge the scientific community to define the genetic requirements for plasmodial gametogenesis to create new targets for malarial control.

Magnitude of the problem and its alignment with scope of the program: Incidence, distribution, and burdens of malaria. Methods currently available for treatment, prevention, and control.

Scientific rationale for proposing the grand challenge, including scientific or technical roadblock and soundness of scientific or technical foundation: Stages of plasmodial life cycle. Opportunity to reduce transmission from acutely and chronically infected individuals to Anopheles by suppressing gametogenesis. Currently very limited understanding of the genetic program that drives gametogenesis. Availability of new tools to support an improved analysis: genomic sequence of P. falciparum, methods for studying gene expression by arrays, cell culture growth of Plasmodium (to evaluate expression patterns in other phases). Potential to use inhibitory RNAs to implicate candidate genes in gametogenesis.

Impact of solving the grand challenge and feasibility of implementing the solution in the developing world: Characterization of the biochemical properties of gene products required for gametogenesis. Development of assays for drug screening, followed by efforts to identify lead compounds. Ultimate possibility of long acting agent that prevents gametogenesis in infected individuals, with decline in incidence of infected mosquitoes and new infections in areas in which the agent is widely used.



Any other comments you wish to make about the proposed grand challenge: